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TABLE OF CONTENTS

Eye Diseases in the African Continent	2
Non-Tropical Sprue	5
Hyperthyroidism and Parkinsonism	7
Noninfectious Necrotizing Granulomatosis	9
Hazards of Elective Induction of Labor	12
SPECIAL NOTICE - Poliomyelitis Vaccine	15
Submarine Physical Examinations	15
MSC Officers Advanced Standing toward College Degrees	16
Applicants Desired for Instruction in Pharmacy Technic	17
American Board of Obstetrics and Gynecology	18
Microbiology Research	18
From the Note Book	20

DENTAL SECTION

Disposition of Dental Records	22
Errors in Dental Service Reports	22
Dental Officers Selected for Long Courses of Instruction	23
Dental Intern Training in Naval Hospitals	24

RESERVE SECTION

Two Weeks' Course in Military Entomology	25
Point Credit for Attending Obstetrics and Gynecology Seminar	25
Some Questions and Answers	26

AVIATION MEDICINE SECTION

Suggestions Wanted - Flight Surgeon's Accident Investigation Kit	27
Medical Aspects of a Cold Weather Survival Trial	33
Aero Medical Association Meeting	38

Eye Diseases in the African Continent

The areas surveyed included the northern territories of Ghana, North Nigeria, and the highlands of the Cameroons. In addition, long treks were made into French Haute Volta, Niger, Sudan, and the Cameroons. The team travelled from Takoradi in the south to Timbuctoo, and via Lake Chad to the coastline at Lagos. In all, some 100,000 miles were covered by lorry, jeep, horse, barge, canoe, or on foot. The survey commenced in November 1952 and finished in June 1956; during this entire period, apart from two periods of leave, the team was actively engaged in ascertaining the causes and incidence of blindness. Six hundred days were spent in the bush living among the natives, the rest of the time being divided between certain large towns and, during the rains, in a clinic at each of the bases.

In all, 5716 cases were examined. The ocular biomicroscope in conjunction with the ophthalmoscope were the two instruments which proved of greatest importance. All the accessories to be found in a modern clinic were available. Illiterate African pagans, however, do not cooperate well with the examiner in such investigations as scotometry and gonioscopy. Subjective tests were always doubtful. As a result, it was extremely difficult at times to make a diagnosis.

The team had a pathologic unit which investigated conjunctival smears, blood films, gland punctures, urine, skin, conjunctival biopsies, and so forth. When further pathologic examinations, not possible in the African bush, were required, an attempt was made—not always a successful one—to take the patients back to the base where such procedures as x-ray studies of the orbit and serologic tests could be done at leisure. In other cases, particularly when investigating the posterior segmental lesion of onchocerciasis, specimens of serum were rushed to the airfield and dispatched in ice to the United Kingdom.

A feature of the survey was the number of important eyeballs which were obtained for subsequent pathologic examination. Twenty eyes, most of rare conditions, were sent to England as well as 80 pieces of tissue. A photographic library of tropical eye diseases was compiled and a special attempt made to assess the part nutrition plays in eye diseases among primitive people. To this end, specimens of food were sent to the United Kingdom for assay and the dietaries of the different tribes recorded; special examinations, such as the use of a dark adaptometer, were also carried out. With the aid of these procedures, it is believed that the picture taken back on completion of the task was a fairly accurate one.

In addition to ascertainment of the facts, the main effort of the team was directed toward a fuller understanding of the clinical manifestations and pathogenesis of ocular onchocerciasis. To this end, resort was made to experimentation with both human and animal material. Such experiments were—not unnaturally—carried out in the field only with great difficulty,

yet often that was the only place they could be carried out. It cannot be said that all questions were answered in relation to this interesting disease, but some were answered, and the fact that several new ones were posed by those participating in the study is in itself valuable.

A great advance was made when a technique was evolved whereby the microfilariae of *Onchocera volvulus* could be isolated and kept alive for up to 24 hours in the laboratory. By this means, these were the first persons to be able to reproduce some of the manifestations of ocular onchocerciasis in experimental animals and to study the course they took.

The incidence of blindness in the territories surveyed was extremely high; in the case of the northern territories of Ghana as high as 3000 per 100,000. This must be about the highest incidence of blindness in the world and is mainly due to the ravages of onchocerciasis. A general picture of the incidence of blindness in Africa has emerged which is supported by figures from other parts of the world. In Europe, the incidence of blindness is about 200 per 100,000. Where trachoma exists, the rate rises to about 500 per 100,000 or higher; in heavily endemic onchocerciasis areas, the figure rises to over 1500 per 100,000.

Statistics published by the Commonwealth Society for the Blind this year (in most cases agreed before publication with the governments concerned) support them. This report shows that in 39 Commonwealth or Mandate territories there are at least 650,000 blind people. The four West African territories, Nigeria, Ghana, the Cameroons, and the Gambia with 400,000 blind—about 1000 per 100,000—constitute by far the largest group; the figures also show 152,000 blind in East Africa, 44,000 in Central Africa, 10,000 in the West Indies, and 25,000 in certain territories of South East Asia. The entire population covered by these territories is 79 million, so that the figure of 3000 blind per 100,000 for Northern Ghana, although high, is by no means inconsistent with the over all picture.

In the territories of northern Ghana, northern Nigeria, the northern Cameroons, and the highlands of the southern Cameroons, the incidence of blindness ranges from 0.5 to 3.0%. The highest incidence was found in the northern territories of Ghana and the lowest in the highlands of the southern Cameroons. There are in these three countries somewhere in the neighborhood of 400,000 blind people. The heaviest area of endemic onchocerciasis was in the northern territories of Ghana where out of a million people the estimate is that 600,000 suffer from the disease; of the 30,000 blind here, it is believed that 18,000 have been blinded by onchocerciasis. There must be about 200,000 blind alone in the areas visited.

Taking this part of Africa as a whole, the principal causes of blindness are trachoma, the purulent keratides (that is, smallpox, measles, et cetera) and senile cataract. Where onchocerciasis is endemic, the chief cause varies according to the density of the infestation by the parasite; in the northern territories of Ghana where the density is high, ocular onchocerciasis is

the chief cause of blindness; in north Nigeria and the Cameroons, it is the chief cause only in certain small areas.

It would seem that, in addition to the formulation of a program to eradicate the fly vector of onchocerciasis and to control the human reservoir in endemic areas, if this terribly high rate of blindness is to be reduced, effort should be directed against such diseases as syphilis, tuberculosis, smallpox, and measles. In short, the prevention of blindness in Africa must first of all be approached from the point of view of the public health services.

It is sad that in this day so many inhabitants of the earth are short of such an essential vitamin as vitamin A. The nutrition of these people suffers and, as indicated in this review, the deficiency of vitamin A certainly appears to reduce the resistance of the ocular tissues to other infections; in many instances, also, it gives rise in itself to ocular lesions.

Multiple infections and deficiencies are more often than not the rule; for example, in one instance, a patient with phlyctenulosis of the eye had, in addition, onchocerciasis, loiasis, bilharzia, and trypanosomiasis. His diet was deficient in vitamin A, protein, riboflavin, and even in calories. As long as such a situation is allowed to continue, there is no hope of reducing the rate of blindness in these territories.

There is an extremely great need for qualified ophthalmologists in every territory in Africa and there is a surprising lack of research into tropical ophthalmology. In this respect, there come readily to mind the terrific potentialities awaiting the arrival of a glaucoma team in a place like Okene, an onchocerciasis team in Navrongo, or a trachoma team in Katsina or Kano. While the government ophthalmologists in these territories carry out good work, it is obvious that they are largely bound to routine clinical duties in the main towns. That is their job. In northern Nigeria, there are four ophthalmologists—three being missionaries—for 16 million people.

Now that the extent of the task is known and the causes of blindness in the different regions understood, two indications clearly remain: (1) There must be prosecution of clinical research into such tropical eye diseases as ocular onchocerciasis with a view to preventing blindness. The author believes this must take place from highly geared research institutes located in the west because a laboratory background is essential. (2) Treatment of the huge number of eye cases needing surgical or medical care; the incidence of eye disease in Africa bears a much higher relationship to the incidence of blindness than it does in Europe. While in tropical countries especially, prevention is always the best line of approach, great and immediate relief can be given by the old methods of surgery and medicine. For this, Africa needs help. Africans themselves must get on with improving their public health services. (Rodger, F.C., *Eye Diseases in the African Continent: Am. J. Ophth.*, 45: 343-358, March 1958)

Non-Tropical Sprue

Nontropical sprue may be defined as a disease of unknown cause and without specific anatomicopathologic changes, occurring in adults living in temperate climates, in which absorption from, and motility of, the small bowel are impaired. The significance of atrophy of the intestinal wall and clubbing of villi, commonly seen in biopsy and necropsy specimens, is not clear. Nontropical sprue includes celiac disease with which it is identical when it persists into adult life. It does not include sprue syndromes arising secondary to diseases characterized by specific pathologic abnormalities, such as regional enteritis, lymphosarcoma, amyloidosis, and Whipple's disease.

The signs and symptoms of impaired absorption from, and motility of, the small bowel and of the secondary deficiency states compose the sprue syndrome. Impairment of absorption in nontropical sprue—contrary to early beliefs—affects all nutrients including fat, protein, carbohydrate, vitamins, minerals, and even water. Although an abnormal amount of fat is the easily recognized and characteristic change in the composition of the feces, the fecal content of nutrients other than fat is also increased. Impaired absorption leads to the several deficiency states: hypolipemia, hypoproteinemia with edema, osteomalacia with hypocalcemia and tetany, hyponatremia, hypochloremia, and hypokaliemia with their well known clinical manifestations, megaloblastic and hypochromic anemias; and deficiency states, including those of all the water soluble and fat soluble vitamins with their well known clinical manifestations as well as weight loss, dehydration, muscular wasting and malnutrition. Whether all the metabolic disturbances demonstrable in nontropical sprue are due to deficiencies caused by impaired absorption, or whether some of them may be manifestations of primary metabolic disturbances of this disease is a question which has not as yet been completely answered.

Familiarity with the course of the disease insures an understanding of the variability of the clinical picture and of the problems of therapy. Nontropical sprue usually follows a chronic course with remissions and exacerbations sometimes extending back into childhood. Malabsorption and its effects on fecal values for all nutrients and the resulting deficiency states vary in intensity with the activity, severity, and duration of the syndrome. Clinical, physical, and laboratory evidences of the several deficiency states also tend to appear and disappear until the disease is well advanced. The spontaneous variations in the severity of the disease constitute an outstanding feature and one which has made appraisal of therapy difficult.

The diagnosis of nontropical sprue rests, first, on demonstration of malabsorption; secondly, on demonstration of the several deficiency states secondary to malabsorption of foodstuffs, electrolytes, and vitamins; and lastly, on exclusion of pathologically recognized entities capable of producing the syndrome.

The syndrome of nontropical sprue should be suspected in every case of intermittent or chronic diarrhea, of latent or active tetany, of osteomalacia with bone pain, of dependent edema for which no other cause is found, and of macrocytic anemia in persons whose gastric mucosa secretes free acid and who do not have disease of the liver. In well established cases in which diarrhea obviously fatty in nature, glossitis and stomatitis, latent or active tetany, dependent edema, and hemorrhagic tendencies are present, the diagnosis should present few difficulties.

The existence of a spruelike syndrome once established, pathologically recognizable entities capable of producing part or all of the syndrome are then excluded. These are pancreatic steatorrhea, regional ileitis, Whipple's disease, amyloidosis, scleroderma, and lymphosarcoma involving the small bowel, operative procedures involving the stomach and small bowel, and steatorrhea complicating diabetes mellitus with neuropathy.

Treatment of nontropical sprue over the years has proved difficult. Repeatedly, early hopes that a remedy might offer consistently dependable relief have not materialized. Experience has taught that dependence should not be placed on a single therapeutic remedy, but that a well rounded regimen based upon sound over all knowledge of the pathologic physiology of the disease should be followed.

General objectives of therapy are to reduce or compensate for malfunction of the small bowel and correct deficiency states. These are accomplished by reduction of physical and nervous stress, by avoidance of irritation, and overburdening of the malfunctioning bowel, by provision of calories, protein, minerals, and vitamins in quantities larger than needed by normal persons, and by employment of drugs that stimulate absorption. The simple matter of reducing undue physical and emotional stress may have a remarkably beneficial effect on an exacerbation of this disease.

Until a specific remedy is discovered, therapy must be directed toward control of malabsorption and correction of the several deficiency states. The corticosteroids and gluten-free diet are promising adjuncts to standard forms of therapy. (Comfort, M. W., Nontropical Sprue - Diagnosis and Therapy: Gastroenterology, 34: 476-483, March 1958)

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Change of Address

Please forward requests for change of address for the News Letter to: Commanding Officer, U. S. Naval Medical School, National Naval Medical Center, Bethesda 14, Md., giving full name, rank, corps, and old and new addresses.

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Hyperthyroidism and Parkinsonism

The simultaneous occurrence of Parkinsonism and hyperthyroidism in the same patient is an interesting relationship and one that presents problems of diagnostic and therapeutic importance.

The essential pathology in Parkinsonism is a degeneration of the projection fiber system of the globus pallidus with some changes of a milder degree in the substantia nigra. These areas, located deep in the cerebral hemispheres, are immediately adjacent to the diencephalic areas of the brain. The diencephalon includes the thalamus, subthalamus, epithalamus, and hypothalamus, which, in turn, includes the neurohypophysis. The neurohypophysis, in combination with the adenohypophysis, forms the pituitary gland.

It seems apparent then that a disease process in either of these areas might well affect both owing to the proximity of their boundaries. Because most endocrinologists agree as to the diencephalopituitary origin of Graves' disease, it is feasible to postulate that a pathologic process, such as Parkinson's disease, located deep in the midbrain, might somehow bring about changes of an irritative character in the immediately adjacent diencephalon which, in turn, would precipitate Graves' disease.

Two main problems are involved in the diagnosis of hyperthyroidism and Parkinsonism. The first is the detection of Graves' disease in a patient with known Parkinsonism which occurs chiefly in the older patient with insignificant or no thyroid enlargement. The second problem is the decision as to whether an existing adenomatous goiter in a patient with known Parkinsonism is producing hyperthyroidism.

Problems related to the treatment of these two diseases are also involved. In the first place, the patient with Parkinson's disease may suffer rapid deterioration and even untimely death if the primary hyperthyroidism is not detected. Under such circumstances, merely treating the Parkinsonism is ineffective. The second problem is obvious. If an elderly patient with Parkinsonism has an adenomatous goiter, the decision as to whether this goiter is to be surgically removed may rest entirely on the presence or absence of hyperthyroidism. Therefore, an accurate diagnosis must be carefully established.

Well established forms of either of these two diseases, existing separately, are usually easily distinguished. When they exist concurrently, the signs and symptoms of the Parkinsonism usually predominate so that the identification of the hyperthyroidism may be difficult. Many of the symptoms and signs of hyperthyroidism are also present in patients who have Parkinsonism only. The following signs and symptoms are common to both diseases: (1) loss of weight, (2) loss of strength (apparent or real), (3) heat intolerance, (4) flushing of skin with increased sweating, (5) emotional lability, (6) widened palpebral fissures, (7) stare, (8) tachycardia, (9) tremor.

The tremor which occurs in the two diseases is dissimilar. That of Parkinsonism tends to be coarse and irregular, varying in frequency from 3 to 10 per second, nonintentional, of a resting type, and may decrease during voluntary action. It usually disappears during sleep and increases in intensity with emotional excitement. The tremor of hyperthyroidism is rhythmical and so fine that it is more easily felt than seen. The tremor is intensified by holding the arms outstretched and spreading the extended fingers. This hyperthyroid type of tremor may be entirely masked by the coarse tremor of Parkinsonism.

Certain features of hyperthyroidism are not a part of the clinical picture of Parkinson's disease. If present, these may "break through" the predominant Parkinsonian features and provide the clinician with a clue to the presence of hyperthyroidism. These features are:

1. Hyperorexia. The marked increase in appetite observed in many patients is absent in Parkinsonism. Anorexia, however, may be present in older patients with hyperthyroidism.
2. The characteristic fine, velvety smooth, warm, moist skin associated with hyperthyroidism is absent in Parkinsonism.
3. Thyrotoxic myopathy (muscle wasting of a severe degree) may occur in primary hyperthyroidism. Temporal muscle atrophy is manifested by a hollowing of the temporal fossae; deltoid, spinatus, interosseous, and quadriceps muscle atrophy may be present and can readily be demonstrated by appropriate tests of muscle strength. Rapid recovery of muscle mass follows adequate control of hyperthyroidism. In Parkinsonism, power of muscular contraction is retained to the end as tested by the patient's ability to resist an opposing movement. Voluntary movement, nevertheless, becomes slow and weak owing to muscle rigidity. Thus, "paralysis" refers only to slowness of movement, not to the power of contraction of muscle.

The relationship of hyperthyroidism and Parkinsonism is discussed principally with respect to pathogenesis, clinical picture, and diagnostic methods. Twelve patients with associated Parkinsonism and hyperthyroidism are reviewed and four representative case histories are presented.

The basal metabolic rate with use of anesthesia has served as a useful decisive diagnostic procedure in difficult cases. Hyperthyroidism should be suspected in every case of Parkinsonism because, if confirmed, treatment of the hyperthyroidism will lead to improvement in the Parkinson's disease. (Bartels, E. C., Rohart, R. R., *The Relationship of Hyperthyroidism and Parkinsonism: Arch. Int. Med.*, 101: 562-567, March 1958)

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Noninfectious Necrotizing Granulomatosis

In 1936 and again in 1939, Wegener reported a syndrome which has aroused widespread interest among clinicians, pathologists, and—more recently—radiologists. His cases presented a severe destructive granulomatous rhinitis associated with ulcerations in the upper respiratory tract. Pulmonary and renal involvement were also prominent features. The illness terminated fatally within 7 months after onset of symptoms. Pathologically the condition was characterized by the presence of a peculiar necrotizing granulomatous process in the upper respiratory tract and sometimes in the lungs, focal glomerulonephritis, and a more or less generalized angiitis which in many respects resembled periarteritis nodosa.

The nasal and facial manifestations of Wegener's cases were similar to those of a condition which had been recognized for many years and reported under various names including lethal granuloma of the midline facial structures, granuloma gangraenescens, and malignant granuloma. Although Wegener maintained that the histologic appearance of the rhinogenous granuloma in his cases differed from that of lethal granuloma, others have considered the two diseases closely related and have suggested that lethal granuloma constitutes the localized form of Wegener's syndrome.

Churg and Strauss reported a group of cases with severe asthma, fever, and eosinophilia in which necrotizing angiitis and extravascular granulomas were present. Recurrent episodes of pneumonia and a variety of cutaneous lesions were additional features of the disease which they called allergic angiitis and granulomatosis. The close similarity of Wegener's syndrome was soon recognized.

There exists a group of diseases bearing an unmistakable resemblance to one another, particularly in regard to the presence of granulomas and angiitis, yet showing distinct differences. First, there is Wegener's granulomatosis with the triad of granulomatous lesions with necrosis in the upper air passages and/or lower respiratory tract, widespread vasculitis, and granulomatous necrotizing glomerulitis. Next, there is lethal granuloma with similar facial and upper respiratory lesions, but frequently without pulmonary, renal, and vascular components. Finally, there is Churg and Strauss' granulomatosis which presents many of the characteristics of Wegener's syndrome, but differs from it in histologic details and in the prominence of the clinical stigmata of allergy.

Many cases of Wegener's syndrome, lethal granuloma, and allergic angiitis and granulomatosis do not present the gamut of features usually described in the literature. In addition, cases have been encountered which apparently represent varying combinations of these three conditions.

Cases falling into this group of diseases have been reported under a variety of appellations in addition to those already mentioned; including

respirato-renal type of polyarteritis nodosa, atypical periarteritis nodosa, giant-cell granuloma, granuloma with periarteritis nodosa, and allergic granuloma. The need for a generic name is, therefore, apparent. Fienberg recommended the term pathergic granulomatosis because the consensus among many contemporary observers is that a sensitivity phenomenon is involved in the pathogenesis. However, in view of the lack of uniformity of opinion on this score, for the present, the authors prefer to use the term noninfectious necrotizing granulomatosis.

It has been speculated that Loeffler's syndrome, cholesterol pneumonia, and eosinophilic granuloma of the lung may represent related conditions. The symptoms, signs, and laboratory aspects of noninfectious necrotizing granulomatosis vary considerably from case to case. The disease appears to be almost entirely confined to adults, usually beyond the age of 30. There is no racial or sex preponderance. The average age of patients in this series is 58 years, the youngest being 37 and the oldest 76. Four are male and 2 are female; 4 are white and 2 are Negroes.

The most common systemic manifestations are fever, weight loss, weakness, anemia, and leukocytosis. Hypertension is infrequent. Allergic manifestations and eosinophilia commonly occur in the type described by Churg and Strauss.

When present, the facial and upper respiratory tract involvement is quite striking. It begins as a superficial ulceration of the nose, nasal mucosa, or palate. This soon progresses to severe destruction of the midline structures of the face, including bone and cartilage. Perforation of the nasal septum is common. Similar lesions may be present in the oral cavity, paranasal sinuses, nasopharynx, and other upper respiratory structures. Otitis media may occur. The lesions may remain confined to these locations resulting in death within 6 to 24 months from inanition or hemorrhage. Whether this localized form of lethal granuloma should be included in this group remains to be determined. However, identical facial and upper respiratory involvement is encountered in patients with the typical disseminated lesions of Wegener's syndrome.

When the lungs are involved, such symptoms as chest pain, cough, hemoptysis, night sweats, and dyspnea are common. Asthmatic episodes are not unusual. Many cases show clinical and laboratory evidence of renal involvement, especially late in the course of the disease. This includes edema, the presence of red and white blood cells, casts, and albumin in the urine, azotemia, and uremic symptoms and signs. Indolent ulcerations of the skin are not uncommon and may, on occasion, be the earliest and most striking feature of the disease.

Because practically any organ of the body may be affected, and because the distribution of vascular involvement may be essentially the same as that in periarteritis nodosa, the signs and symptoms often closely simulate the latter disease. Clinical manifestations referable to the nervous system, myocardium, bones and joints, and gastrointestinal tract are not uncommon.

The average duration of the disease from time of onset to fatal termination is said to be about 6 months, although individual patients may live for several years. Generally, it is assumed that the disease is uniformly fatal. At least this has proved to be true in all the recognized cases. The longest survival from onset of symptoms to death among the present cases was 15 months.

With severe involvement of the facial structures, there is usually roentgen evidence of extensive sinusitis, obliteration of one or both nasal passages, and destruction of a sinus wall, nasal septum, or other segments of the facial skeleton. Laryngeal and tracheal involvement can occasionally be demonstrated by tomography.

A diversity of chest roentgen findings has been reported in the literature. Not uncommonly, the chest film is normal initially and may remain so until death, even in cases in which pulmonary involvement is found at autopsy. Nonspecific changes, such as bronchopneumonia, congestion and edema, and pulmonary infarction are common. Roentgen findings directly attributable to the pulmonary granulomas as confirmed by autopsy are well documented, but the pattern is not consistent.

From the foregoing, it is obvious that the roentgen appearance alone is not pathognomonic of necrotizing granulomatosis. However a relatively common pattern—and one which is extremely suggestive of the diagnosis—is that of solitary or multiple nodules or infiltrates, chronic in nature, with central cavitation. Even when cavitation is not apparent, the roentgen findings, if associated with such clinical manifestations as allergic symptoms, eosinophilia, facial or skin granulomas, or evidence of severe renal disease, may provide the clue to the correct diagnosis.

Lethal granuloma of the facial and upper respiratory structures is simulated by malignant neoplasm and specific granulomas, such as tuberculosis, syphilis, fungus disease, and leprosy. Biopsy, cultures, and serological examinations usually serve to exclude these diseases. The condition must also be differentiated from pemphigus, erythema multiforme, agranulocytosis, and Vincent's angina. Thus, the diagnosis of lethal granuloma is one of exclusion unless evidence of systemic vascular involvement is present.

Other forms of periarteritis nodosa may be difficult or impossible to distinguish from necrotizing granulomatosis, especially in the absence of facial or cutaneous granulomas. Pulmonary and renal involvement are common to these conditions and even muscle biopsy may not distinguish them. It is here that the chest roentgenogram may prove to be the most important tool in the differential diagnosis.

Diagnosis depends on the presence of several manifestations, such as allergic background, destructive granulomatous lesions of facial and upper respiratory structures, skin granulomas, eosinophilia, renal disease, and the described roentgen changes. (Felson, B., Braunstein, H., Noninfectious Necrotizing Granulomatosis: Radiology, 70: 326-331, March 1958)

Hazards of Elective Induction of Labor

Despite the fact that the exact physiologic mechanism of the normal spontaneous onset of labor is as yet unknown, it is well established that amniotomy is the most efficient method of inducing labor. There have been a number of excellent articles published justifying or opposing the elective induction of labor. Unfortunately, the majority of the published reports have been based on small selected series; consequently, the results have been favorable and much of the discussion pro and con has been along philosophical lines. For this reason, it seems appropriate to review critically a large series of electively induced labors to ascertain what the hazards are from this procedure when the patients are selected by a large group of residents in training.

The staff of the Department of Obstetrics and Gynecology of the State University of Iowa Hospitals has had an extensive experience with the elective induction of labor at term. These obstetric patients come from all parts of the state and when pregnancy is uncomplicated, they are brought to the hospital 2 weeks before term. Between July 1, 1926 and December 1, 1956, there were 28,253 patients delivered; in this group, labor was electively induced at term in 6860 (24.3%). None of these patients had medical complications requiring induction and all infants were alive and judged to be of term size at the time of induction. Each chart was reviewed and the pertinent data placed on a standard punch card for ease of analysis. It is interesting to note that, while 25% of the deliveries were private, labor was induced electively in only 664 private patients, or 9.7% of the series despite the fact that many of them came a considerable distance.

Over the years, there have been many variations in the techniques used. The authors have attempted to keep the procedures as simple as possible. During the first few years of the study, labor was induced by castor oil, soapsuds enema, quinine, or rupture of the membranes, followed by intermittent injections of pituitary extract. Gradually, the procedure was modified. First, the quinine was discontinued, then the castor oil, and since September 1954, Pitocin has been used unless there was a latent period of 12 to 24 hours. The efficiency of induction has improved over the years which emphasizes that simple amniotomy is the key to success along with careful selection of patients.

The following criteria for induction have been established: (1) The patient should be selected prior to her admission to the delivery room upon findings obtained by abdominal palpation and sterile pelvic examination. (2) The fetus should be at term and its estimated weight over 2800 grams. (3) The presenting part should be fixed and the presentation a vertex. (4) It should be a single pregnancy. (5) The external os should not be posterior and should be at least 2 cm. dilated and partially effaced.

There is adequate proof that simple rupture of the membranes is the simplest and most effective means of artificially inaugurating uterine contractions. Three-fourths of the present patients were in active labor within 3 hours after induction and only 5% had a latent period of over 24 hours. In the beginning of the series, labor was stimulated in many patients with Pituitrin after the rupture of the membranes. Since 1954, oxytocics have seldom been used and 684 labors have been induced with amniotomy alone. Of this group, 82.3% were in labor in 3 hours and only 17, or 2.3%, received Pitocin stimulation.

In certain areas of the country, there seems to be a trend to use intravenous Pitocin routinely as soon as amniotomy is performed. The Pitocin is continued after contractions are well established, so actually normal labor is being accelerated with Pitocin under the guise of induction of labor. This procedure should be heartily condemned as dangerous and unnecessary. In Iowa, several ruptures of the uterus have been reported following such a technique.

Despite all safeguards, there are certain inherent dangers associated with the elective induction of labor. With present techniques, the dangers to the mother are minimal unless Pitocin is used injudiciously. In 1940, however, there was one maternal death in the present series which was directly related to the induction. Today, no doubt, this death could have been prevented. Thus, the principal dangers of induction are fetal. Prematurity remains a real hazard, occurring 212 times in this series with a mortality rate of 10%. A second danger is that of a prolonged latent period or prolonged labor with an intrapartum fever.

Routine prophylactic antibiotic therapy is unwise in cases of electively induced labor, but should be given if the latent period is over 12 hours. In the authors' experience, antibiotic therapy has not completely eliminated intrauterine sepsis or the respiratory complications in the fetus. If the patient has not gone into labor within 12 to 24 hours after the induction, the uterus should be stimulated by intravenous Pitocin drip. If labor does not start within 24 hours following induction or if labor is prolonged from uterine inertia, serious consideration must be given to cesarean section. The authors have been unwilling to consider cesarean section in these patients because of the circumstances under which labor was started. With the increased fetal loss encountered in such instances, however, it seems that abdominal delivery would be justified to improve fetal salvage.

The third hazard encountered is that of a malpresentation which may be unrecognized at the outset or may develop after labor is induced. Membranes should not be ruptured unless the head is fixed. After the induction, if the presenting part seems higher than it was at the time of rupture, or if it feels irregular, an immediate sterile pelvic examination should be performed. There is always the possibility of a shoulder, a compound or breech presentation developing subsequent to the amniotomy.

The fourth hazard is prolapse of the cord. Undoubtedly, certain of the 22 instances would have occurred with a normal spontaneous onset of labor; but since labor was induced, responsibility must be accepted. Most of the cord prolapses were associated with malpresentation, high presenting part, or a prolonged latent period. More careful selection of cases would have eliminated some of the cord complications.

The place of elective induction of labor in present-day obstetrics is difficult to evaluate. After many years of experience, the authors' attitude is extremely conservative; labor is being induced in fewer ward patients than before and only when there is serious overcrowding. At the present time, elective induction is performed in only a small percentage of private patients. Undergraduates are taught the indications for therapeutic induction and the techniques to be used. Elective induction of labor is not recommended and its dangers are emphasized.

There is no question that a successfully induced short labor occurring during the day is very impressive to the young medical student, intern, or general physician. He sees the specialist do this and naturally feels he would like to offer this to his patients. He does not realize that the proper selection of patients for induction requires much more training than a year's internship.

The trained obstetrician should have sufficient experience properly to select the patients so that the maternal and fetal complications will be minimal, but even the most experienced will occasionally misinterpret his findings and complications will occur which result in fetal death. The general practitioner is performing, and should continue to perform, the majority of uncomplicated deliveries. He does not have sufficient experience in the early years of practice, however, in evaluating the size of the fetus, the station of the head, and the effacement of the cervix to select patients properly for induction. Hence, it seems unwise for him to induce labor electively. This conclusion is reached on the basis of the authors' experience with elective induction where the selection of patients was done by their assistant residents whose experience seems quite comparable. It is believed that a loss of 39 babies, or almost 0.6% is a significant price to pay for convenience. (Keettel, W.C., Randall, J.H., Donnelly, M.M., The Hazards of Elective Induction of Labor: Am. J. Obst. & Gynec., 75: 496-504, March 1958)

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Policy

The U. S. Navy Medical News Letter is basically an official Medical Department publication inviting the attention of officers of the Medical Department of the Regular Navy and Naval Reserve to timely up-to-date

items of official and professional interest relative to medicine, dentistry, and allied sciences. The amount of information used is only that necessary to inform adequately officers of the Medical Department of the existence and source of such information. The items used are neither intended to be, nor are they, susceptible to use by any officer as a substitute for any item or article in its original form. All readers of the News Letter are urged to obtain the original of those items of particular interest to the individual.

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SPECIAL NOTICE

Poliomyelitis Vaccine

It is expected that BuMed Instruction 6230.8B, Poliomyelitis Vaccine, will be revised to reflect the following:

1. A full course of 3 doses for all military personnel will be required.
2. A routine 4th dose will not be recommended.
3. Under special circumstances, such as the occurrence of proved poliomyelitis in a community or travel to an area of high prevalence, medical officers may give a 4th dose if no dose has been received in the preceding year.

It is of paramount importance that all persons who have started the immunization series receive a full course of 3 doses of vaccine; they cannot be considered vaccinated until they have done so.

Expenses involved in carrying out this program during the remainder of fiscal year 1958 must be within available funds.

(ComDis Branch, PrevMed Division, BuMed)

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Submarine Physical Examinations

Review of applications for duty in submarines reveals that noncompliance with the provisions of Change 6 to the Manual of the Medical Department which revised the vision requirements (Article 15-29(2) (b)) is creating some confusion, some wasteful travel culminating in rejection of the applicant after arrival at New London, and in general is uneconomical.

The revision of visual standards was a liberalization based on studies of useful vision by the Naval Medical Research Laboratory, New London. The new standards permit assignment to submarine duty of certain personnel whose vision can be corrected to 20/20 by the adjustments available on

Navy binoculars and periscopes used aboard submarines. Examinations in the field often record the unaided vision and state "corrected to 20/20 by lenses." This is not sufficient information for the use of the group screening applications. It is desired that when lenses are required, the kind (cylindrical or spherical) and power (in diopters) be stated on the Report of Physical Examination (Form 88). The recording of vision then must include the refraction prescription if glasses are used.

Compliance with this detail will make available a considerable pool of manpower now rejected. In addition, it will obviate the necessity for requests for this information and demoralizing disappointments when rejected after long and expensive travel. Economy is everybody's business. Compliance in this matter will save money and extend manpower. (SubDiv, BuMed)

* * * * *

MSC Officers Advanced Standing
toward College Degrees

In reviewing records of Medical Service Corps applicants for out-service courses of instruction, it is noted that many of these officers have no idea as to the number of credits earned through participation in various educational programs. Generally, this is an individual matter, although of interest to the Bureau. There are instances, however, when the availability of complete information as to educational endeavor and the measure of advanced standing toward an academic degree become pertinent. For example, this Bureau sponsors certain full-time, outservice programs which lead to degrees, provided established grade-point requirements are met. While it is true that the individual's attainment of a degree may be purely incidental to completion of a course of instruction which is justified on the basis of meeting a service requirement, it is useful in judging aptitude and academic potential to have some measurable quantity of accomplishment.

A recent University Bulletin indicates that advanced standing toward the degree of Associate in Arts (60 semester hours) may be earned up to a maximum of 36 semester hours by the following methods:

1. College level GED tests
2. Service schools (as evaluated by USAFI)
3. Correspondence courses (college level)
4. Validating examinations (conducted by the University for degree candidate).

Two suggestions are made in line with the above:

1. Medical Service Corps officers who anticipate competing for the limited number of training billets available annually will be well advised to have their educational experiences evaluated by accredited civilian institutions. Consult local Information and Education Officers (or Training Officers) for procedural details.

2. Having obtained such evaluation, forward appropriate resume and documentary evidence of advanced standing to the Bureau (in duplicate) for file in official records. (MSC Div, BuMed)

* * * * *

Applicants Desired for Instruction
in Pharmacy Technic

As a result of the release to inactive duty of large numbers of registered pharmacists (2-year inductees), coupled with the fact that quotas for this course of instruction remain unfilled and by reason of expanding operational requirements in this specialty, a large training requirement has been generated. Therefore, it is incumbent upon each command to give wide publicity to the continuing need for qualified applicants for training in this specialty.

Information

Course Title	Pharmacy Technic
Length	38 weeks
Convening date	30 June 1958
Location	USNH, Portsmouth, Va., USN Hospital Corps School, San Diego, Calif.
Subjects	Principles of Pharmacy Operative and Dispensing Pharmacy Pharmaceutical Mathematics Materia Medica and Toxicology Inorganic and Organic Pharmaceutical Chemistry
Obligated Time	24 months upon entry into course
Eligibility Requirements ..	All HM1, HM2, HM3 with combined GCT and ARI score of 110*

Command Responsibility

1. Solicit and encourage applications for subject course utilizing all available publicity media.
2. Evaluate each prospective candidate relative to educational background, practical experience in the technical specialty requested, positive motivation, career motivation, physical and mental fitness.

3. Endorse all applications so that the results of paragraph (2) above are reflected.

Action by Applicants

1. Prepare application in accordance with the sample contained in BuMedInst 1510.4C and comply with instructions contained in the Catalog of Hospital Corps Schools and Courses, BuMedInst 1510.9.

Note: Applications should be received in the Bureau of Medicine and Surgery not later than 15 May 1958.

* Applications for waiver of GCT and ARI Test Scores will be considered.
(ProfDiv, BuMed)

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American Board of Obstetrics and Gynecology

Applications for certification (American Board of Obstetrics and Gynecology), new and reopened, Part I, and requests for reexamination Part II, are now being accepted. All candidates are urged to make such application at the earliest possible date. Deadline date for receipt of application in September 1, 1958. No applications can be accepted after that date.

Candidates for admission to the examinations are required to submit with their application, an unbound 8-1/2 x 11 typewritten list of all patients admitted to the hospitals where they practice, for the year preceding their application or the year prior to their request for reopening of their application.

Office of the Secretary: Robert L. Faulkner, M.D.
2105 Adelbert Road
Cleveland 6, Ohio
(ProfDiv, BuMed)

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Microbiology Research

The Office of Naval Research has funded in fiscal year 1958 the following projects in the field of Microbiology:

<u>Title</u>	<u>Investigator</u>	<u>Institution</u>
Production of Tetanus Toxoid	Dr. M. D. Eaton	Harvard University
Effect of Arginine Analogues on	Dr. K. S. Pilcher	Oregon State Col.
Animal Viruses		

<u>Title</u>	<u>Investigator</u>	<u>Institution</u>
Production of and Chemical Characterization of Slime Layers of Microorganisms	Dr. F. E. Halleck	Loyola University
Cellular Immunity in Granulomatous Infections	Dr. S. S. Elberg	Univ. of Calif.
Study of Parasitic Mites	Dr. G. W. Wharton	Univ. of Maryland
Group A Hemolytic Streptococcal Infections & the Biochemistry of the Microorganism	Dr. H. D. Slade	Northwestern Univ.
Biophysical Investigations on Bacteriophages	Dr. Max Lauffer	Univ. of Pittsburgh
The Mode of Action of Antibiotics on Bacteria	Dr. C. Phillip Miller	Univ. of Chicago
Resistance in Systemic Mycotic Infection	Dr. S. Marcus	Univ. of Utah
The Role of Steroids in the Metabolism of Microorganisms	Dr. W. J. van Wagtendonk	Indiana University
Salt Water Fungi	Dr. E. S. Reynolds	Univ. of Miami
Nutritive Value of Fungi and Their Synthetic Products	Dr. M. W. Jennison	Syracuse Univ.
Amino Acid Metabolism in Bacteria	Dr. J. M. Prescott	Texas Agriculture Experiment Station
Effect of Rapid Heat Treatment on the Antigenic Structure of Bacteria	Dr. W. Litsky	University of Mass.
The Transformation of Carotenoids by Marine Bacteria	Dr. J. R. Merkel	Col. of Charleston
Biological Agent Decontamination	Dr. C. Lamanna	Univ. of Calif. (NBL)

<u>Title</u>	<u>Investigator</u>	<u>Institution</u>
Concurrent Effect between Virus and Bacteria in Enteric Infections	Dr. T. Moll	State Col., Wash.
Relationship of a Bacterial Toxin to the Pathogenesis of Rheumatic Fever	Dr. S. P. Halbert	Columbia University
Mechanisms Involved in Changes of Bacterial Virulence	Dr. S. M. Beiser	Columbia University
Factors Influencing Viral Parasitism	Dr. J. A. Baker	Cornell University
Microbial Oxidation of Hydrocarbon Gases	Dr. R. J. Strawinski	Louisiana State Univ.
Factors Affecting the Permanent Efficiency of the Antibody-Producing Mechanism	Dr. A. M. Schectman	Univ. of California
Chemical Nature of Virus Protein	Dr. R. F. Acker	Iowa State College
Factors Involved in Resistance to, and Recovery from, Shigellosis	Dr. L. W. Parr	George Wash. Univ.
Experimental Enteric Infections of Laboratory Animals	Dr. Rolf Freter	Jefferson Med. Col.

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From the Note Book

1. Rear Admiral B. W. Hogan MC USN, Surgeon General of the Navy, attended the Medical Conference of the Surgeons General of the NATO countries at SHAPE Headquarters. Following the conference, the Surgeon General visited Naval Medical facilities in France, England, Spain, Italy, and the Naval Medical Research Unit in Cairo, Egypt. (TIO, BuMed)
2. BuMed Notice 5750 advises that the Navy Nurse Corps will attain its Golden Anniversary on 13 May 1958, and requests that this event be observed

and publicized. Arrangements are being completed for national radio and television programs, press releases, special brochures and posters, "sticker stamps" for all mail, and newspaper mats to enable commercial advertisers to "salute" the Navy Nurse Corps. Articles for publication in professional and military journals are also being prepared.

3. The Ninth Annual Combined Scientific Meeting of the Philadelphia County Dental Society and the staffs of the U.S. Naval Hospital, Philadelphia, and U.S. Naval Dental Clinic, Naval Base, Philadelphia, was held 2 April 1958 in the auditorium of the Naval Hospital. The speaker was Andrew J. Ramsey, Ph.D., Director of the Daniel Baugh Institute of Anatomy, Jefferson Medical College, who spoke on "Facial Development." (USNH, Philadelphia)

4. The second annual Captain Robert Dexter Conrad Award, established by the Office of Naval Research, was presented on 11 March 1958 to Dr. Charles C. Lauritsen, Professor of Physics, California Institute of Technology. This award is made in recognition of, and reward for, outstanding technical and scientific achievements in research and development for the Navy. It is named for the late Captain Conrad who as first head of the Planning Division of ONR was the primary architect of the Navy's basic research program. (ONR)

5. The procedure followed in a roentgen survey of the breast of 1200 healthy women is described. Periodic reexamination of this group is planned for a 10-year period. The foremost objective of the survey is detection of mammary cancers before they become clinically evident. Secondary goals are the establishment of roentgen criteria of normal variations and a long-term follow-up of mammary dysplasias to determine their relationship to carcinoma. (Surgery, March 1958; J. Gershon-Cohen, M.D., H. Ingleby, M.D.)

6. It is rarely possible to establish with certainty the diagnosis of acute pancreatitis based upon bedside examination. The diagnosis may be suspected along with many others, but it is freely admitted that acute pancreatitis follows no consistent pattern and that it masquerades in many different guises. (Gastroenterology, March 1958; H. L. Bockus, M.D.)

7. The effects of intravenously administered epinephrine, isoproterenol, levarterenol, phenylephrine and sodium lactate on ventricular rhythmicity and atrioventricular conduction have been studied in 83 drug trials in 21 patients with Stokes-Adams disease. (Circulation, March 1958; P. M. Zoll, M.D., et al.)

8. Amebiasis in the subacute or chronic phase occurring in office patients is discussed. This form of the disease is an important clinical problem because of its incidence and potentially severe manifestations. (Am. J. Med. Sci., March 1958; R. B. Miller, M.D.)

DENTAL**SECTION**Disposition of Dental Records

The Bureau of Medicine and Surgery continues to receive dental records of personnel who upon transfer or separation from the service failed to check out with the cognizant dental department. In order to avoid an accumulation of dental records, it is essential that all medical and dental departments maintain close liaison to insure that medical records are released only when they contain the appropriate dental records.

Attention is invited to Article 6-108(3), Chapter 6 (Rev.), Manual of the Medical Department, for proper disposition of the dental records of transferred or separated personnel.

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Errors in Dental Service Report

Numerous errors have been noted in Dental Service Reports (DD 477) from submitting activities. Examples of the most common errors are:

Write-in entries not placed in proper classification
Examinations greater than patient load
Unauthorized treatments (orthodontics) not explained in Remarks
Section
Incomplete reports
Total procedures in error

It is essential that close attention be given to the instructions contained in Article 6-150, Chapter 6 (Rev.), Manual of the Medical Department, to assist in the proper preparation of the Dental Service Report. Closer monitoring of reports by reviewing officers will do much to eliminate the submission of erroneous reports.

* * * * *

Dental Officers Selected for Long
Courses of Instruction

The Dental Training Committee, Dental Division, Bureau of Medicine and Surgery, selected the following Navy Dental officers for postgraduate, residency, and advanced training during fiscal year 1959:

Postgraduate Course, U. S. Naval Dental School

CDR Marvin (n) Carmen	LT Roger H. Flag
CDR Edward G. Hutton	LT Richard D. Foster
CDR Winthrop F. Smith	LT Russell A. Grandich
LCDR Don C. Bursey	LT Charles D. Hancock
LCDR William H. Cook	LT Joseph E. Hartnett
LCDR Robert W. Didion	LT Edwin L. Hoffius
LCDR William G. Hutchinson	LT Corey H. Holmes
LCDR John W. Pentecost	LT Philip C. Hotz
LCDR Donald S. Taber	LT David J. Knoedler
LT Roy K. Atkinson	LT Robert S. Nolf
LT Rodman Brakow	LT Robert W. Slater
LT Albert A. Capozzoli	LT James H. Stanley
LT Niel C. Demaree	LT John J. Webb
LT Norman E. Duggan	LT Robert A. Wooden

Residency Training in Oral Surgery (First Year)

LCDR Homer S. Samuels (USNH, St. Albans)
LT Robert W. Bagby (USNH, San Diego)

Residency Training in Prosthodontics

CDR Richard W. Hughes (USNDS, NNMC, Bethesda, Md.)
CDR Gilbert H. Larson (USNDS, NNMC, Bethesda, Md.)

Residency Training in Periodontics

CAPT Julian R. Conant (USNDS, NNMC, Bethesda, Md.)

Specialized Course in Oral Surgery - USNDS, NNMC, Bethesda, Md.

CDR Howard B. Marble, July 1 - December 30, 1958
CDR Ingram W. Ogden, January 1 - June 30, 1959

Long Courses in Civilian Dental Schools

CDR G.H. Rovelstad - Dental Research
 LCDR W.B. Gregory - Endodontics
 LCDR J.E. O'Malley - Periodontics

* * * * *

Dental Intern Training in Naval Hospitals

Eight U. S. Naval Hospitals will conduct Navy Dental Intern Training Programs for eighteen Dental officers during fiscal year 1959. This training is designed to broaden the knowledge and experience of recently graduated Dental officers in accordance with the standards of the American Dental Association for rotating type internships. The Dental officers and participating naval hospitals are:

USNH, Chelsea

Angelo E. Amato
 Charles T. Arnold

USNH, St. Albans

Raymond J. Begin
 Constantine J. Cavalaris
 Robert L. Creedon

USNH, Philadelphia

Russel L. Corio
 Edwin D. Joy, Jr.

USNH, Portsmouth

Henry P. Koutouzakis
 Raymond D. Nable

USNH, Great Lakes

Ronald H. Johnson
 Ralph R. Stocker

USNH, San Diego

Norman C. Bitter
 Henry E. Richter, Jr.

USNH, Camp Pendleton

James R. Toolson
 James J. Verunac

USNH, Oakland

Jesse T. Gentry
 Ronald E. Hillenbrand
 Ferris R. Thompson

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The printing of this publication was approved by the Director of the Bureau of the Budget, 16 May 1955.

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RESERVE SECTION

Two Weeks' Course in Military Entomology

The Naval Medical School, National Naval Medical Center, Bethesda, Md., will conduct a fourteen-day training course in Military Entomology during 14-27 July 1958. This annual training course, intended to be conducted on a year-to-year basis, has been established with the following main objectives:

1. To provide advanced training for active duty and Reserve entomologists of the three military services.
2. To make known to individuals and organizations the contributions which the military services have made and are making to the science of entomology and the control of pests and vectors.
3. To indicate the nature of the entomological problems which confront the Armed Forces and to stimulate the scientific research in basic and applied problems which require attention.
4. To develop a continuing sympathetic and cooperative attitude toward Military Entomology on the part of universities and other civilian organizations.

Eligible inactive Reserve Medical Service Corps officers whose specialty is entomology of both pay and non-pay programs of the Naval Reserve may request this training. Quotas will be allocated to the Third, Fourth, Fifth, Sixth, and Ninth Naval Districts. Messing and BOQ facilities at the Naval Medical Center are available. Minimum uniforms for a two-week period are necessary. Security clearance is not required.

* * * * *

Point Credit for Attending Obstetrics and Gynecology Seminar

Eligible inactive Naval Reserve Medical Corps officers have been authorized to receive one Naval Reserve retirement point credit for daily attendance at the Obstetrics and Gynecology Seminar convening at the Naval Hospital, National Naval Medical Center, Bethesda, Md., 5-9 May 1958.

As obstetrics and gynecology represent a most significant specialty of military medicine, attendance at this seminar affords an excellent

opportunity for inactive Reserve Medical officers to keep abreast of current concepts and recent developments in this field as practiced in the military services.

To insure proper Reserve accreditation, inactive Reservists are required to record their daily attendance with the military representative present. Security clearance is not required.

* * * * *

Some Questions and Answers

1. In the event I am unable to participate actively in the pay or non-pay programs of the Naval Reserve, how can I earn promotion points and accrue satisfactory years of Federal service?

You may enroll in approved correspondence courses and earn all of the necessary promotion and retirement points needed.

2. If I am a member of a drilling unit of the Naval Reserve and I temporarily change my residence, can I attend the drills of a nearby Reserve unit?

Yes, Naval Reservists whose temporary residence is not in the vicinity of the regular drilling unit may request orders for temporary additional duty under instruction at a unit nearby. Of course, the unit to which you would be temporarily assigned must be able to provide appropriate training.

3. If I participate in Reserve training and do not meet the minimum point requirement annually in order to earn a year of satisfactory Federal service, are the points that are earned lost?

The retirement points are not lost; they are added to the final accumulative total used to determine your retirement pay.

4. Is there a limit to the number of retirement points that I may earn in a fiscal year?

The limit of sixty points applies only to points earned through participation in the "Inactive" phase of training, such as those earned through correspondence courses, drills, and the fifteen gratuitous membership points or in a combination thereof. There is no limit for the accumulation of points earned for active duty for training, extended active duty, and/or group training duty (in the latter case, no more than three days at one time). These types of participation are considered to be "Active" phases of participation.

5. How can I be sure that I have earned a year of satisfactory Federal service?

As a Reserve officer you will receive information concerning retirement (and promotion) points earned under Public Law 810 by requesting such data from the Reserve Officers Performance Recording Activity, 30 & Fort Streets, Omaha 11, Neb. Such requests may be made no more than once a year.

6. Is continuous satisfactory Federal service required under Public Law 810 to qualify for retirement?

No. Public Law 810 requires only that you complete twenty years of satisfactory service.

7. Is the amount of retirement pay I will receive based on satisfactory years only or do the number of points earned determine the amount of pay?

The number of retirement points earned is used to determine the amount of retirement pay you will receive. However, you must have earned twenty years of satisfactory Federal service to be considered eligible to receive retirement pay at age sixty.

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AVIATION MEDICINE DIVISION



Suggestions Wanted!

All flight surgeons have received a copy of the new "handbook," Aviation Medical Safety Training, NavTraDevCen 1339-28-2. In this publication, reference is made to a proposed Flight Surgeon's Accident Investigation Kit. The contents for this proposed kit are listed below. Comments and suggestions are hereby solicited on the items included in this list. Perhaps a handy gadget or two have been omitted. If so, the Aviation Medicine Technical Division (Code 523), Bureau of Medicine and Surgery, would like to know about it. (This is not an "official" list of items for such a kit—it is simply a composite of several such kits presently being used in the investigation of aircraft accidents.)

Flight Surgeon's Accident Investigation Kit

In order for the flight surgeon to investigate adequately the human factors aspects of aircraft accidents, it is imperative that he have the proper

equipment. It is recommended that each naval air facility, ashore or afloat, maintain an "Accident Investigation Kit" for use by the flight surgeon. This kit should be packaged in portable form so that it can be used at the site of the crash when required.

The following list of items has been drawn from an earlier listing prepared by the Armed Forces Institute of Pathology and from materials included in a kit prepared at the Naval School of Aviation Medicine.

Materials

<u>Stock Number</u>	<u>Item</u>	<u>Unit</u>	<u>Qty</u>
	Adhesive Plaster, 1/2 in. Roll		1
	Applicators, Cotton Tipped 1 doz. (Pkg.)		1
*8405-715-0450D	Apron, Laboratory, Plastic	Each	1
*NSL	Autopsy Scale, with Metric Calibrations, for Weighing Organs	Each	1
8105-299-9800	Bag, Cellophane, Pathological		
-9801	Specimen, Polyethylene, Lined,		
-9802	Laminated		
-9817			
*6515-344-7320	Blade, Surgical Knife, Detachable, No. 21, 6's	Pkg.	2
5110-224-7055	Bolt, Cutter, Angular	Each	1
8125-408-9055	Bottle, Wide Mouth, Round, 120 ml.	Each	1
8115-408-9964	Box, Ointment, Tin, 2 oz. 12's	Pkg.	1
6640-408-9915	Box, Plastic, 100 Slides	Each	1
6520-567-2000	Boxing Wax, Dental 1 lb. Sheet	Box	1
9930-799-8140	Burial Pouch, Human Remains	Each	1

<u>Stock Number</u>	<u>Item</u>	<u>Unit</u>	<u>Qty</u>
*6515-343-7100	Cartilage Knife, Curved 7 in. Post Mortem	Each	1
*6515-318-0150	Catheter, Urethral, Coude' Tip Mercier, #18 French	Each	1
*6515-317-1200	Catheter, Urethral, Metal, Blunt Tipped, #18 French	Each	1
*6545-914-3480	Chest, Medical Instrument & Supply Set	Each	1
*6515-319-3200	Chisel, Bone, 5 in.	Each	1
Open Purchase	Condoms 2 doz.	Pkg.	1
L 6510-201-4000	Cotton, Absorbent, 1 lb. Roll		1
*6515-366-9200	Forceps, Bone Cutting, Bethune, 13-1/2 in.	Each	1
*6515-331-1800	Forceps, Bone Cutting, Straight, Liston, 8-3/4 in.	Each	1
*6515-333-3600	Forceps, Dressing, Straight, 5-1/2 in.	Each	1
*6515-334-7100	Forceps, Hemostatic, Straight, Rankin, 6 in.	Each	2
*6515-337-9900	Forceps, Tissue, Tweezers 5-1/2 in.	Each	1
*6515-344-7820	Handle, Surgical Knife, Detachable Blade, No. 4	Each	2
*6515-299-8325	Forceps, Tissue, Russian, 6 in.	Each	1
	Flashlight, Dry Cell, with Batteries	Each	1
*5110-344-9900	Knife, Craftsman's, 5 in.	Each	1

<u>Stock Number</u>	<u>Item</u>	<u>Unit</u>	<u>Qty.</u>
*7340-299-8522	Knife, Slicing, 16 in. Blade	Each	1
7810-240-1500	Label, Micro. Slide	Book	1
7510-431-1750	Labels, Gummed, Large	Book	1
*6515-340-6500	Mallet, Autopsy, Metal, with Hook	Each	1
*6640-494-3893	Microscope, Slides	Box	1
6515-348-7500	Needles, Hypo. 19 Ga. 1-1/2 in. Blood Collecting Oxylate	Each	1
*6515-352-2300	Needle, Suture, Postmortem, Half-curved, Cutting Edge, 5 in.	Each	1
L 7510-436-5210	Pencil, Wax, Red 12's	Box	1
L 7510-436-5220	Pencil, Wax, Blue 12's	Box	1
8315-787-7000	Pins, Safety, Large 12's	Pkg.	1
G-5120-239-8254	Pliers, Flat Nosed, Lineman, Side Cutting 6-1/2 in.	Each	1
*6515-356-9500	Probe, General Operating, 10 in.	Each	1
*6515-331-4600	Rongeur, Curved, Hartmann, 7-1/4 in.	Each	1
6515-339-7900D	Rubber Gloves, Surgical, Size 8-1/2	Pair	1
7510-612-7500	Ruler, Plastic, Transparent, 18 in.	Each	1
NZ -8460-308-8225	Satchel, Physicians' Leather Knickerbocker Style	Each	1
6515-363-1100	Saw, Amputating, Satterlee, 8 in. Blade	Each	1

<u>Stock Number</u>	<u>Item</u>	<u>Unit</u>	<u>Qty.</u>
*6515-365-0640	Scissors, General Surgical, Straight, Double Sharp, 5-1/2 in. Long, 1-3/4 in. Cut	Each	1
6515-364-2100	Scissors, Enterotomy, 8 in.	Each	1
*6515-364-0920	Scissors, General Surgical, Straight, Mayo, 6-3/4 in.	Each	1
*6515-364-4200	Scissors, Iris, Angular, 4-1/2 in.	Each	1
	Sodium Chloride, 8 oz. Bottle		
6515-380-5900	Syringe, Needle, Lock, 10 cc. with Syringe Rings	Each	1
	Tape, Measuring Steel, 100 ft.	Each	1
6640-443-4650	Test Tubes, 16x125 mm. Screw Cap	Pkg.	1
1950 Catalog #8642	Thermos, Laboratory Vessel, Made of Pyrex Brand Glass in #820 Case. Capacity 4300 cc. Approximate Cost: \$17.34	Each	1
G-5120-449-8083	Wrench, Adjustable, Single Open End, Jaw Opening 8-1/2 in. Length 10 in.	Each	1

In addition to the above items, the following seem appropriate for inclusion:

Light, Ultra-Violet, Portable, Battery Operated with 2 Lights (2537 A. U. and 3660 A. U.) and Dark Chamber for Field Use.	1
Recorder, Tape, Portable (For record- ing statements of witnesses and survivors)	1

<u>Item</u>	<u>Qty.</u>
Camera, 35 MM., with Flash Attachment (Color Film Should be Provided.)	1
Bottle, Spray, Ethyl Chloride	1
Check-List, Laminated Plastic with Attached Grease Pencil	1

NOTE: A supply of dry ice should be readily available for use in the thermos to freeze tissue specimens.

Organization of the Kit

The Kit should be packaged in sections according to the following list of needs:

A. Site of Crash Equipment

1. Reserve Equipment

- a. Pliers, cutters, et cetera., needed to release a trapped pilot and to remove sections of safety equipment for later detailed analysis.

2. Collection Equipment

- a. Test tubes, slides, syringes, thermos, plastic bags, rubber gloves, et cetera, needed to collect blood samples and tissue specimens for later analysis or shipment to a central facility, such as the Armed Forces Institute of Pathology.

3. Check List

- a. Laminated plastic check list to insure an orderly and comprehensive coverage of the accident. The outline to go on the check list can be obtained from the section on "Accident Investigation Procedures."

B. Autopsy Materials*

1. Field Use

- a. These materials should include only utensils which might be required for an immediate examination of the pilot.

2. Mortuary Use

- a. These materials should include everything required for a complete autopsy protocol.

C. Accessory Materials

1. Ultra-violet light, portable
2. Tape recorder, portable
3. Camera, 35 mm.
4. Dry ice supply. This should be kept in close proximity to the Kit and in small packages so it can be transferred to the Kit immediately upon need.

* Those items in the initial list which are asterisked are felt to belong in this grouping. It may be desired to retain most of these materials in a separate kit which will not be taken into the field.

* * * * *

Medical Aspects of a Cold Weather Survival Trial

In recent years, there has been an increasing awareness of the "food-intake - energy output" balance which must be maintained if the body weight is to remain constant. RCAF medical officers are frequently questioned by aircrew regarding dietary matters. Their questioning is particularly orientated to the problem of actual survival on a very limited diet, say in the middle of winter.

How often have you, as a medical officer, been faced with such questions as: Can I actually live on "jelly-beans" (the AFFP1 Survival Ration)? How would I feel? Would I be able to do much work and would I lose much weight? How long will it take me to recover completely after I am rescued?

In attempting to answer such questions, the medical officer is all too frequently obliged to form his answers on the basis of his formal university training in medicine alone rather than by supporting his answers by citing a number of concrete examples. It seems probable, therefore, that the

medical officer may find it easier to answer such questions on survival if some of the medical findings of a cold weather survival trial conducted in 1955 be presented here.

During the last ten days of January 1955, a cold weather user trial of flying and survival clothing and equipment was conducted 25 miles north of RCAF Station Cold Lake, under the sponsorship of the Central Experimental Proving Establishment. There were nine subjects. All were active aircrewmen. Their ages varied from 24 to 39 years of age with an average of 32.5. All subjects were appointed to the trial without option of volunteering. The amount of previous bush experience which the individuals possessed varied from negligible to considerable; only one subject had in the past attended the Survival Training School Winter Bush Course. Three of the subjects were jet aircrew, the remaining six flew piston-engined aircraft. These latter six were organized into a representative transport aircrew. The test area was a lake in an uninhabited section, and the subjects were dispersed around the perimeter in four test sites; each of the jet aircrew subjects occupied an individual location whereas all six subjects of the representative transport aircrew occupied a common test site. No communication was allowed between the subjects occupying different test sites, nor were the accomplishments and state of well-being or otherwise of the occupant or occupants of any one test site transmitted by the test observers to other test sites.

The subjects were equipped only with the clothing and equipment which normally would be available to them in an emergency; i. e., the three jet aircrew subjects had Inland Winter Survival Kit Seat Packs, whereas the representative transport aircrew group had Six-Man Survival Kits and Basic Aircraft Kits. All subjects were issued with parachutes. The three jet aircrew subjects wore only underwear beneath their flying suits; the crew group personnel wore working dress beneath their flying suits. The weather could be considered as good, but extremely variable during the trial. There were bright and dull days; some days were very windy; some snow fell, but there were no heavy falls. The temperature varied between -30°F . and $+32^{\circ}\text{F}$. with an average value of $+10^{\circ}\text{F}$.

It must be stressed in this simulated survival trial, that attempts were made only to duplicate the physiological stresses which might be encountered in a true survival emergency. No attempt was made to duplicate the psychological stresses since (a) the subjects were uninjured, (b) the subjects knew exactly when the trial would both commence and terminate, and therefore, had adequate time to mentally prepare themselves, and (c) the subjects were aware that should they encounter serious difficulties, immediate assistance would be available.

The results of the trial were obtained from observations made by the trial observers during the trial, from interviews, from questionnaires, and from narrative accounts written by each subject immediately upon completion

of the trial. For the purposes of this article, the equipment findings are not presented. Only those findings with a direct medical interest are discussed.

All subjects completed the trial successfully. It was, therefore, demonstrated that when subjected to the conditions prevailing at that specific test-site: (1) aircrew, whether they are lone subjects or as a group of crew subjects, can survive for at least ten days if wearing the clothing and using the equipment which is normally available to them in an emergency, and (2) not one of the subjects either suffered extreme discomfort or was incapacitated (all were fit to resume full duty within a twenty-four hour period). No case of frostbite was encountered. One subject developed a mild dermatitis (of unknown etiology) over the back and buttocks, but this did not cause serious concern. One other subject developed a sinusitis which persisted throughout one night only.

No attempt is made in this article to discuss the ideal design of a survival ration. Much controversy still continues on this subject. The AFFP1 ration is a food packet designed to meet the survival requirements of aircrew. Many factors were considered in its design; e. g., the caloric requirements of a survivor, toxic metabolic end products, the space and weight which are permissible, palatability, digestibility, et cetera. The ration was shown to be superior to other rations on Operation Calorie. Operation Calorie, however, was conducted during summer and the ration had not been tested by users in the cold.

Each subject was permitted to take with him into the test-site fifteen cents worth of candy of his own choosing as an additional item to the two tins of the AFFP1 ration. Each tin of rations contains four days' supply of food, being composed of starch, jelly candy, shortbread, soluble coffee, and Vitamin C tablets. One day's ration approximates 628 kilogram calories and comprises the following items: 125.2 gm. of carbohydrate, 13.0 gm. of fat, 2.4 gm. of protein, and 315 mgm. of Vitamin C. All subjects fasted during the first day of the trial and then consumed the AFFP1 rations during the remaining nine days.

All subjects were allowed to consume any game which they were capable of acquiring. Game, however, was scarce. One jet aircrew subject caught nothing. Another shot and consumed three Canada Jays and one squirrel totalling perhaps one pound. The third jet aircrew subject fished diligently through ice holes and caught four small Northern Pike of which he consumed about two pounds during the last five days of the trial. The six-man crew consumed one badly mutilated partridge, one squirrel, and approximately ten pounds of fish during the last six days of the trial.

On this restricted diet, no extreme discomfort was suffered from hunger, but while all subjects noticed a lessening of staying power, no noticeable deterioration of immediate strength was experienced. A moderate

degree of sluggishness and lightheadedness immediately after rising was noticed by some, but this passed off when normal activity was undertaken.

The weight loss of the subjects varied between 8-3/4 lbs. and 13 lbs. with an average value of 11.2 lbs. While no follow-up surveillance of the subjects' weights after the trial was attempted, all subjects reported that they had regained their normal weight within the period of the next four days. It is suggested that dehydration could account for almost all of this weight loss since, in reality, drinking-water was very hard to come by. As evidence of this, jet aircrew subjects had only ration containers in which to melt ice and snow. This container is shallow and most unstable. The crew personnel who had pots and ice chisels in their survival kits had ready access to lake water. The majority of the subjects, however, found the lake water unpalatable. This was due to the great number of very small shrimp-like water life which swarmed around the ice holes. One jet aircrew subject fashioned a water bag out of the sheet of polythene in which the sleeping bag is packed and by filling this water bag with snow and hanging it close to the fire, procured a plentiful supply of warm drinking-water. To flavor the drinking-water, all subjects eked out the package of soluble coffee (which is intended for one cup) to make five or six cups of very dilute coffee. Some subjects also made a beverage from the leaves of the Labrador Tea Bush. All subjects remarked on how highly colored their urine became and they tried to correct this by increasing their water intake.

At the conclusion of the trial, no difficulties or complications of any kind were encountered in returning to a normal diet. Each received one special meal only, after which he indulged freely in the regular menu. The one special meal was designed to prevent gastric upset, being high in protein content and free from fat and consisting of a skimmed milk eggnog, boiled beef tenderloin, shrimps, fruit cocktail, un buttered bread, sweetened clear tea, and raw fruit.

With regard to shelters, the crew personnel found that the six-man survival tent was too cold to sleep in since there is no way of heating it. They used it on the first night only. Subsequently, they lived in a spruce-bough lean-to and continuously maintained a roaring fire until the end of the trial. They found the Arctic Three-Star Bag uncomfortably cold and always wore their clothing during sleep.

Each jet aircrew subject constructed a lean-to shelter of different design—two incorporated parachute cloth while the third made his shelter of spruce-boughs only. These three subjects allowed their fires to go out each night and rekindled them each morning with the idea that they would lose more heat by rising during the night to restoke the fire than they would have gained from a continuous fire. They slept in their Chinook lightweight sleeping bags, dressed only in their underwear and stated they were comfortable except during the first two nights. It is possible that they had not sufficiently "fluffed" their vacuum-packed bags on the first two nights and that this could account for their initial coldness.

Morale throughout the trial was extremely high except in the case of one jet aircrew subject. This subject appeared to suffer more from loneliness than from any other factor. By the fourth day, while he was not lethargic, he was in such low spirits that serious consideration had to be given to the advisability of withdrawing him from the trial. On the fifth day, however, he appeared to have readjusted his outlook and his morale improved appreciably during the remainder of the trial period. No explanation is offered for this transient depression. Not one of the subjects adopted the fatalist's attitude of "Here I am for ten days and 'I'll just sit it out.'" The reverse was most evident, all subjects appearing to make it a challenge to live as comfortably as possible with the materials at hand. All defied boredom by remaining active. Their activities varied depending on their initiative and experience. There was always firewood to be gathered and prepared; some subjects went hunting; others, fishing. Nearly all were inventive and improvised gadgets and pieces of equipment. One jet aircrew subject who was an experienced fisherman was particularly desirous of trying his luck at fishing; but since fishing gear was not included in his survival pack, he had to fashion his own from the materials at hand. He did this most skillfully using his fingers for a vise and his clasp knife as a multi-purpose tool. For a hook he straightened, sharpened and bent one of the double eyelets on his parachute container. He then fashioned a spoon lure from a piece of the ration tin and decorated it with red flannel from his parachute container. An abundance of fishing line was made available by removing the inner nylon strings from the core of the shroud lines. As a tool for cutting through the twenty inches of lake ice, he used the marlin spike on his clasp knife which was lashed to a large pole. This crude device, in his hands, apparently could make a suitable ice hole more quickly and with less energy expenditure than a proper ice chisel in the hands of the trial observers.

In closing, it seems appropriate to quote verbatim from the concluding paragraphs of one of the jet aircrew subjects' narratives:

"My morale was excellent over the test period. I would not allow myself to think of my loved ones and I tried to occupy my mind with thoughts of what to do. Maybe I planned on how to make snowshoes, or to build a cabin should the stay be prolonged, knowing full well that tomorrow I wouldn't carry out the plans; but the constructive thinking did pass the time away. Keeping occupied passed the time well—I could have carried my wood in half the number of trips, but I purposely brought out only one or two poles at the time, so that it would take me longer to bring out the required firewood. Thinking more of the future and less of the past seemed to pass the hours pleasantly.

When I caught my first fish, my morale went to its peak. Thereafter, camp life developed into a fishing holiday. When I left, there was several days' supply of fish in my shelter. I consumed only approximately

4 oz. of the fish at a meal and I would have it only twice a day so that I wouldn't get tired of it. Had I been able to catch fish from the start, and having only one candy square per meal, I could have extended the supplied rations for two months. However, I tried to extend it only for eleven or twelve days. I brought out eight candy squares. After the first day of starvation, hunger did not bother me excessively.

Having survived so well, I know now that I could have expended more energy had it been necessary. However, I used only a minimum of energy to keep warm and do necessary chores; and when I came out, I had lots of energy.

It has been a worthwhile test and very revealing to me in the endurance of the body—how it gets adjusted to the cold and the fairly small quantity of food required to exist. "

(Flight Leader D. J. G. Soper, Aeromedical Reports, Institute of Aviation Medicine, Royal Canadian Air Force, Toronto, Canada, October 1957)

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Aero Medical Association Meeting

With the Honors Night Dinner on Wednesday night, 26 March, the 29th annual meeting of the Aero Medical Association held at the Hotel Statler, Washington, D. C., came to a most successful conclusion. More than 1500 members and guests enjoyed the scientific and social events that crowded the three days preceding the dinner.

In all, 131 scientific papers were presented at 17 distinct panel discussion periods. All panel sessions were extremely well attended and high interest was shown in the many technical and scientific exhibits.

The meeting was opened by greetings from the Association's President, Captain Ashton Graybiel MC USN, who then introduced Dr. Rudolfo Margaria of Milan, Italy, who gave the 1958 Lewis H. Bauer Lecture on Wide Range Acceleration Investigations in Man and Animals. Dr. Margaria is Professor of Physiology and Biochemistry at the University of Milan and is an eminent pioneer in the field of aviation medicine.

The Fellows Group of the Association met for dinner at the Officers' Club, U. S. Naval Gun Factory, Monday, 24 March, and selected the following Association members into their group:

Capt. Norman L. Barr MC USN
Brock Rousseaux Brown, M. D.
Radm. Winfred P. Dana MC USN (Ret)
Sir P. B. Lee-Potter, M. D.
Col. Charles H. Roadman, USAF (MC)

Maj. David G. Simons, USAF (MC)
Capt. William M. Snowden MC USN
Hubertus Strughold, Ph. D., M. D.
Clayton S. White, M. D.
Capt. Carl E. Wilbur MC USN

Dr. Howard Karsner, Research Advisor to the Surgeon General, U. S. Navy, was selected as an Honorary Member of this group.

Captain Graybiel presided over the annual business meeting at noon, Tuesday, the 25th, which selected Dr. George Kidera of United Airlines, Chicago, Ill., as First Vice-President. Among other business accomplished, the Association unanimously approved a resolution strongly recommending the strengthening and enlarging of the Medical Division of the Civil Aeronautics Administration.

At noon on Wednesday, the 26th, 191 members of the Space Medicine Branch met in the main ballroom of the Mayflower Hotel for their annual luncheon and meeting. Dr. Albert Mayo presided and was succeeded by Dr. Hubertus Strughold as Chairman. Major D. G. Simons, USAF (MC), gave an interesting talk on animal research in high altitude rocket tests. Dr. Strughold also gave his report of the 1957 International Astronautics Federation meeting held in Barcelona, Spain.

Tuesday evening, Captain and Mrs. Graybiel hosted an International Reception at the Officers' Club at the National Naval Medical Center, Bethesda, Md., for the 73 members from 23 foreign countries attending the meeting. Many of the Association's prominent members and their ladies attended.

The Honors Night Dinner was the culminating event of the meeting. The four members honored are:

The Theodore C. Lyster Award - Recipient: Dr. Hubertus Strughold

The Lyster Award is given annually for outstanding achievement in the general field of Aviation Medicine.

The Raymond F. Longacre Award - Recipient: Colonel Harry G. Moseley, USAF (MC)

The Longacre Award is given annually for outstanding accomplishments in psychological and psychiatric aspects of Aviation Medicine.

The Arnold D. Tuttle Award - Recipient: Dr. S. J. Gerathewohl

The Tuttle Award is given annually to an individual or group for the most significant contribution toward solution of a challenging problem in Aviation Medicine by original research which has been published in the Journal of Aviation Medicine during the previous two years.

The Eric Liljencrantz Award - Recipient: Brigadier General Victor A. Byrnes, USAF (MC)

The Liljencrantz Award is given annually by the Charles Pfizer & Co., Inc.; an inscribed medal with accompanying \$500 honorarium is the award for an outstanding contribution to basic research in the field of Aviation Medicine.

Following an address by Martin Agronski, Dr. Graybiel turned the office of the President over to the then President-Elect, Brigadier General M. S. White, USAF (MC), and the meeting was considered terminated.

One hundred and sixty-two members of the Wives' Wing had an active social program during the entire three-day meeting, being regaled with a fashion show, a tea, an annual luncheon and business meeting, and an embassy tour.

The next annual meeting of the Aero Medical Association will be held in the Hotel Statler, Los Angeles, Calif., 26-29 April 1959. All medical officers interested in aviation and/or space medicine are invited to attend and participate.

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